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BELLARDIA TRIXAGO (OROBANCHACEAE): 40 YEARS OF RANGE EXPANSION IN TEXAS AND A FIRST REPORT FROM LOUISIANA

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ABSTRACT

The naturalized occurrence of *Bellardia trixago*, a species known as adventive to Texas since 1970, is reported and documented for an additional set of counties. Study of the distribution of the species in Texas led directly to its discovery in Louisiana, reported here as new to that state. The collections are mapped by county with symbols to indicate the date of first collection, showing the chronological spread of the species.

KEY WORDS: Orobanchaceae, Scrophulariaceae, *Bellardia,* lineseed, Texas, Louisiana, USA, adventive

Bellardia trixago (L.) All. (Orobanchaceae) is native to the Mediterranean region from Portugal and Morocco east to Turkey, Syria, and Jordan (excluding Egypt but including Mediterranean islands and Madeira and the Azores of the Atlantic Ocean). The species has been introduced to Argentina and Chile (Tropicos.org 2011), Australia (FloraBase 2011), the Canary Islands (Euromed 2011), and the USA. The genus was formerly included as a member of the Scrophulariaceae, in the traditional sense a family consisting of about 275 genera and 5000 species. It is now placed in the Orobanchaceae, which includes the hemiparasitic genera (e.g., *Orobanche*, *Castilleja*, *Pedicularis*, *Seymeria*, and others; see Olmstead 2002 for a summary of the dismemberment of the Scrophulariaceae into at least seven families).

The common name most often used in the USA (Mediterranean lineseed) seems to be newly coined, since the species is not native to any English-speaking country. It possibly alludes to the longitudinally ribbed seeds (as described by Polunin 1969), a condition that could be interpreted as "lined." In error, the name lineseed is often rendered as "linseed." Another common name is "sticky bellardia" and in Spain the species is generally known as *gallocresta* (Spanish, "cock's comb").

Bellardia in the USA is adventive in California (Weatherwax 1993) and Texas, where first reported from Navarro County by Lipscomb and Ajilvsgi (1982), although a collection from Leon County had been made 10 years earlier (see below). In Texas, *Bellardia* typically occurs along highway roadsides and rights-of-way, vacant lots, and pastures where it is conspicuous by height and color among the colorful spring wildflowers.

Do et al. (1996) provided an account of the expanded distribution of *Bellardia trixago* in Texas to include Anderson, Brazos, Colorado, Freestone, Harris, Henderson, Hill, Kaufman, Leon, Liberty, Limestone, Milam, Montgomery, and Robertson counties. Continued general collecting in the state has resulted in the discovery of the species in additional counties, and new records since the report by Do et al. are documented here. Additionally, Turner et al. (2003) mapped the species in the Ellis, Johnson, Tarrant, and Walker counties but we have not located vouchers for those records.

Voucher specimens. **USA. Texas.** Austin Co.: NE side of FM 1094, ca. 2.3 road mi NW of jct FM 2187, NW of Seely, locally frequent in sandy loam on gently unshaded roadside through Fayette Prairie, 31 Mar 1999, *Carr 18040* (TEX). Chambers Co.: at intersection of I-10 and Hwy 1406 at Winnie, frequent white-flowered herb on disturbed soil, 29 Mar 1997, *Brown 20144* (TEX). Fayette Co.: SE side of St. Rte. 237, 2.3 road mi NE of jct FM 1291 South, just NE of Warrenton, locally frequent in sandy loam over Oakville Sandstone (Miocene), unshaded grassy roadside through Fayette Prairie, 29 Mar 1999, *Carr 18000* (TEX). Gillespie Co.: Hwy 290, ca. 0.1 mi E of KOA Campground near "25 miles to Johnson City" road sign, N side of Hwy 290, 20 Apr 2005, *Singhurst 13342* (BAYLU). Grimes Co.: FM 105 between Plantersville and Navasota, 6 Apr 2003, *Stancik 64* (BAYLU). Hays Co.: 6 mi E of Dripping Springs on Hwy 290, N side of Hwy 290, 20 April 2005, *Singhurst 13344* (BAYLU). Jefferson Co.: Jct. of I-10 and St Rt 365 at Fannett, Texas, S. side of I-10 and E side of State Rte 365, 28 Apr 2004, *Singhurst 13520* (BAYLU). Kaufman Co.: 2.6 mi. S of jct of Hwy 175 and FM 274, W side of 274 (just W of Cedar Creek Reservoir), 5 May 1995, *Singhurst 3263* (TEX). McLennan Co.: Texas Hwy 31, 1.3 mi W of FR 1330, just west of Axtell, 10 Apr 1999, *Holmes 9924* (BAYLU). Orange Co.: Jct. Hwy 105 and Hwy 73 in West Orange, ca. 0.2 mi S on Hwy 73 and E side of Hwy 73, 29 Mar 2007, *Singhurst 16124* (BAYLU). Parker Co.: U.S. Hwy 180 at jct with FM 113, ca. 12 mi W of Weatherford, 7 May 1998, *Holmes & White* (BAYLU). Rains Co.: State Hwy 47 at Sabine River on Sabine River Authority property, 18 Apr 2000, *White s.n.* (BAYLU). Travis Co.: 0.1 mi S of jct of Slaughter Lane and Hwy 1 (Mopac Expressway), W side of Hwy 1, 13 April 2005, *Singhurst 14181* (BAYLU). Victoria Co.: Goliad, 17 Apr 2010, *Nitschmann 16* (TAMU, fide TAMU 2011). Waller Co.: Hwy 290 West, beside Hempstead/Magnolia exit, FM 1488, 10 Apr 2007, *Idowu 85* (BAYLU).

The species has not been reported in Louisiana by Thomas and Allen (1998), USDA, NRCS (2010), or Neyland (2011) but a brief excursion into Louisiana, barely 16 kilometers east of the locality in Orange Co., Texas, resulted in the discovery of the species, reported here as new to Louisiana. Voucher specimen. **USA. Louisiana.** Calcasieu Parish: Jct Hwy 109 and I-10, disturbed highway right-of-way in the town of Toomey, northwest corner of jct along access to I-10, 29 Mar 2007, *Singhurst 16125* (BAYLU).

The Louisiana locality is the easternmost record for the species in the USA and an excellent starting point to chronicle the expected spread of the species further eastward. Associated flora at the Toomey locality included introduced and disturbed-site species such as *Cynodon dactylon, Bidens alba, Bromus* sp., *Centaurium pulchellum, Cyperus* spp., *Chloris gayana, Nothoscordum bivalve, Trifolium* spp., *Medicago* sp., and *Vicia ludovicicana*.

The rapid dispersal of *Bellardia trixago* in Texas over the last 30-40 years is remarkable (Fig. 1). Dispersal clearly is along highway corridors, the tiny seeds presumably whipped along by natural winds and by those created by cars and trucks. The most recent movement is southwestern (Gillespie, Hays, and Travis cos.), southern (Victoria Co.), and southeastern (Jefferson and Orange cos., both bordering southwest Louisiana). Movement northward appears to be slower, perhaps indicating ecological limitations.

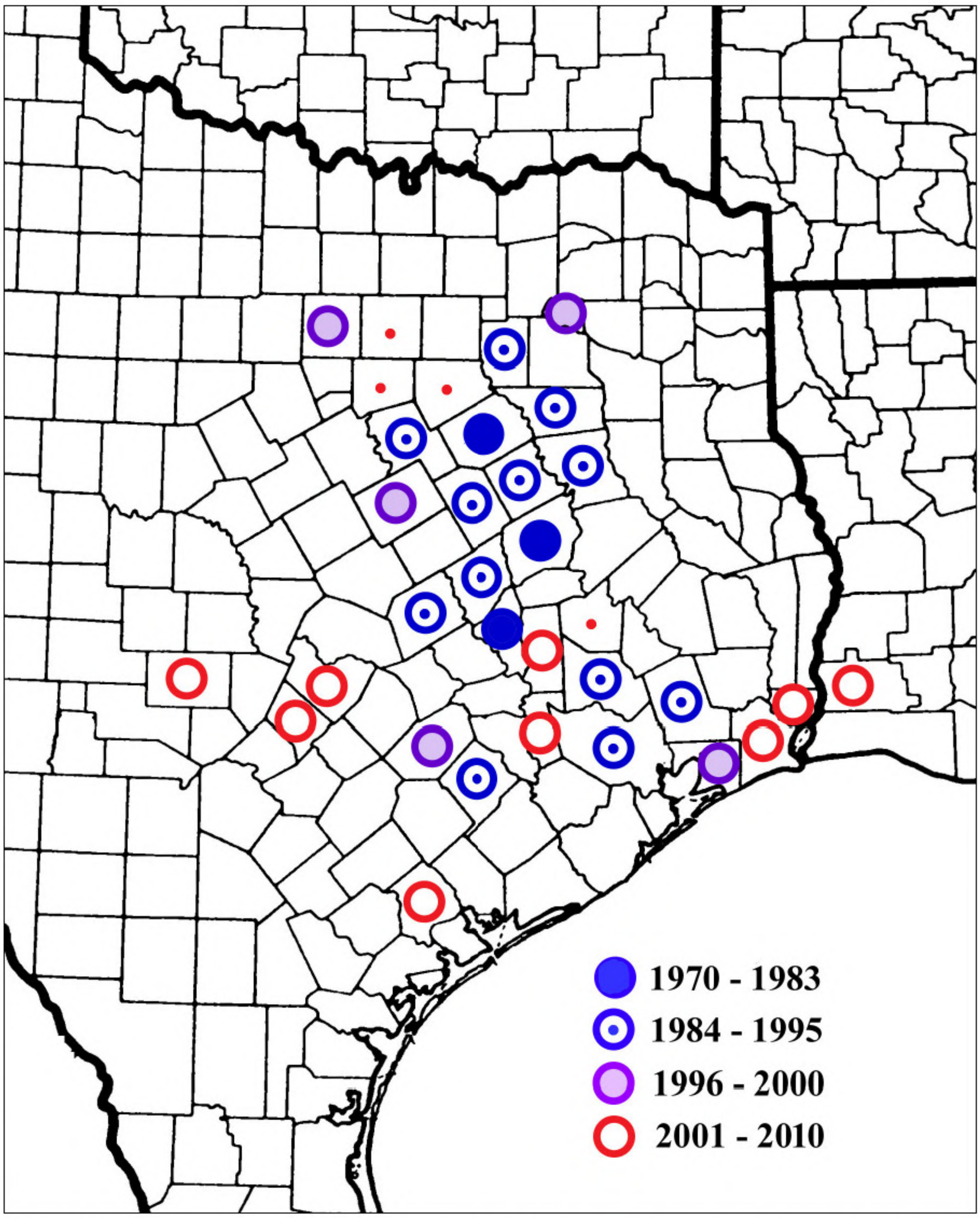

Figure 1. Distribution and chronological spread of *Bellardia trixago* in Texas and Louisiana. Small red dots are records from the Texas atlas by Turner et al. (2003) — vouchers not located in the present study.

Records for the oldest Texas collections mapped on Figure 1 are these. Brazos Co.: W side of roadside of W Loop 2818 at jct of 2818 and Carson Street, 20 May 1983, *Ajilvsgi 8390* (TAMU). Leon Co.: off Hwy 75 at Leona, along roadside, 4 May 1970, *Lundell & Lundell 18514* (LL). Navarro Co.: open pasture ca. 11 mi SE of Corsicana, 19 Jun 1980, *Ajilvsgi s.n.* (SMU).

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